R E P O R T R E S U M E S

ED 003 057 24

PERSONALITY TRAITS RELATED TO "STRESS TOLERANCE" AS DETERMINANTS OF ACADEMIC ACHIEVEMENT.

BY- RUETHE, JAMES L.
JOHNS HOPKINS UNIV., BALTIMORE, MD.

REPORT NUMBER CRP-1218 PUB DATE 61
EDRS PRICE MF-$0.09 HC-$1.16 29P.

DESCRIPTORS- *PERSONALITY ASSESSMENT, *PERSONALITY STUDIES, *ACADEMIC ACHIEVEMENT, ACADEMIC PERFORMANCE, ACADEMIC APTITUDE, GRADES (SCHOLASTIC), COLLEGE STUDENTS, *ADJUSTMENT (TO ENVIRONMENT), STUDENT ADJUSTMENT, *STRESS VARIABLES, PSYCHOLOGICAL PATTERNS, BALTIMORE, MARYLAND, MINNESOTA MULTIPHASIC PERSONALITY INVENTORY (MMPI), SCHOLASTIC APTITUDE TEST

THE PURPOSE OF THIS INVESTIGATION WAS TO ISOLATE PERSONALITY TRAITS THAT ARE RELATED TO ACADEMIC ACHIEVEMENT INDEPENDENT OF CORRELATIONS WITH INTELLECTUAL CAPACITY AS MEASURED BY THE SCHOLASTIC APTITUDE TEST, ACADEMIC RANK AS A HIGH SCHOOL SENIOR, AND TEACHER RECOMMENDATIONS. THIS RESEARCH CENTERED ON THE CAPACITY OF THE INDIVIDUAL COLLEGE FRESHMAN TO FUNCTION IN STRESS SITUATIONS, CONSIDERED TO BE AN IMPORTANT FACTOR IN ACADEMIC ACHIEVEMENT. THE SUBJECTS WERE 351 MALE COLLEGE FRESHMEN. THE PSYCHASTHENIA SCALE OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY (MMPI) AND TWO MEASURES OF THE ACQUIESCENCE RESPONSE SET WERE ADMINISTERED TO ALL SUBJECTS. IN THE OVERALL ANALYSIS GAINED AFTER THE SUBJECTS COMPLETED THEIR FRESHMAN YEAR, CERTAIN RELATIONS BETWEEN THE VARIABLES WERE FOUND TO BE QUITE CONSISTENT. THE CORRELATIONS BETWEEN PSYCHASTHENIA SCORES AND GRADE POINT AVERAGES WERE ALWAYS NEGATIVE. CORRELATIONS BETWEEN ACQUIESCENCE AND GRADE POINT AVERAGES WERE TYPICALLY NEGATIVE, AS WERE THE SIGNIFICANT CORRELATIONS BETWEEN VERBAL APTITUDE AND ACQUIESCENCE. THE ACADEMIC PERFORMANCE OF MOST OF THE SUBJECTS DURING THEIR FRESHMAN YEAR RELATED TO THE PERSONALITY VARIABLES IN THE SAME MANNER THAT THE PERSONALITY VARIABLES RELATED TO PERFORMANCE IN NONSTRESS EXPERIMENTAL STUDIES, AND IS NOT RELATED TO FACTORS INHERENT IN THE ACADEMIC SITUATION. (GD)

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education
This document has been reproduced exactly as received from the person or organization originating it. Points of view or opinions stated do not necessarily represent official Office of Education position or policy.

Personality Traits Related to "Stress Tolerance" as Determinants of Academic Achievement

Cooperative Research Project No. 1218

James L. Kuethe

The Johns Hopkins University

Baltimore, Maryland

1961

The research reported herein was supported through the Cooperative Research Program of the Office of Education, U. S. Department of Health, Education, and Welfare.

ED003057

Personality Traits Related to "Stress Tolerance" as Determinants of Academic Achievement

James L. Kuethe
The Johns Hopkins University

Students are accepted by many colleges and universities on the basis of scores from the Scholastic Aptitude Test, the student's academic rank in his high school senior class, and recommendations of the high school teachers. The achievements of many students in college are not commensurate with the potential indicated by these selection indices. The problem is to identify those students who will have trouble in college even though they have demonstrated adequate intellectual ability. The purpose of this investigation was to isolate personality traits that are related to academic achievement independently of correlations with intellectual capacity.

Lack of academic achievement typically is revealed by low grades in the courses taken by the individual. Many students of high intellectual ability complain to their advisors that even though they have prepared adequately for a test they did not do well because of the anxiety generated by the examination situation. These students will often speak of feelings of "panic" or of "going to pieces" during the examinations. An important factor in academic achievement seems to be the capacity of the individual to function in stress situations.

The college student is subjected to a variety of stresses in addition to examinations; these include the general atmosphere of competition, the student's doubts about his vocational choice, and often, his fears about acceptance into medical school or other graduate school. The major stress of adjusting to a new environment is especially critical for

the many students who are away from home for the first time.

A considerable volume of research has related scores on the Psychasthenia Scale to performance in stress situations. In the following discussion, subjects with high scores on the Psychasthenia Scale will be referred to as Pt+ subjects and subjects with low scores will be referred to as Pt- subjects.

Stress has been found to activate the characteristic defense mechanisms of the high and low scorers on the Pt Scale. These defense mechanisms play a critical role in determining the adequacy with which behavior can be "monitored." For example, it is the high scorer on the Pt Scale that is able to recall his failures in a performance situation that is accompanied by stress.[1] The low scorer on the Pt Scale becomes more stereotyped when subjected to stress.[2] Under stress the Pt+ subject is "on guard" and expects the worst to occur.[3] This tendency in a stress situation results in the Pt+ subject carefully monitoring both environmental events and his own responses. Stress has been found to impair the learning of hysteric subjects while learning by subjects high on the Pt Scale showed little or no disturbance.[4]

---

[1]Eriksen, C. W. Psychological defenses and "ego strength" in the recall of completed and incompleted tasks. J. abnorm. soc. Psychol., 1954, 49, 45-50.

[2]Kuethe, J. L. and Eriksen, C. W. Personality, anxiety, and muscle tension as determinants of response stereotypy. J. abnorm. soc. Psychol., 1957, 54, 400-404.

[3]Kuethe, J. L. and Hulse, S. H. Pessimism as a determinant of the tendence to claim undesirable symptoms on personality inventories. Psychol. Reports, 1960, 7, 435-438.

[4]Deese, J., Lazarus, R. S., & Keenan, J. Anxiety, anxiety reduction, and stress in learning. J. exp. Psychol., 1953, 46, 55-60.

Subjects with high Pt scores have been found to possess more insight into their learning behavior than subjects with low scores.[1] The suggestion has been made that it is the tendency of the Pt+ subject to monitor his behavior when under stress that allows him to make novel rather than "automatic" responses.[2]

The joint use of the acquiescence response set and the Pt scale permit an improvement in the use of the Pt Scale for predicting reactions to stress. Research indicates that the acquiescence measure serves to identify those low scorers on the Pt Scale who would have earned high scores had they not been prevented (consciously or unconsciously) by the implications of agreeing to the items on the scale.[3,4] These subjects seem to be using defenses related to repression or denial as a response to the threat of the test. However it is these subjects who do less conscious monitoring of their behavior in non-stress situations.

In contrast, those low scorers on the Pt Scale who do not show the acquiescence response set may be "true" low Pt subjects in the sense that while they are agreeing to all of the symptoms that they actually possess, they earn a low Pt score because they do not have many symptoms. These

---

[1]Eriksen, C. W., Kuethe, J. L., and Sullivan, D. F. Some personality correlates of learning without verbal awareness. J. Pers., 1953, 26, 216-228.

[2]Kuethe, J. L. The interaction of personality and muscle tension in producing agreement on commonality of verbal associations. J. abnorm. soc. Psychol. (in press)

[3]Kuethe, J. L. The acquiescence response set and the Psychasthenia Scale: An analysis via the "Aussage Experiment." J. abnorm. soc. Psychol. (in press)

[4]DeSoto, C. B., and Kuethe, J. L. The set to claim undesirable symptoms in personality inventories. J. Consult. Psychol., 1959, 23, 296-500.

subjects since they are not using defenses are more likely to be aware of influences from the environment and as a result not respond to them in an uncritical manner.

Similarly, the high scorer on the Pt Scale is not using defenses of the repression or denial variety. One way in which this is apparent is the fact that he is capable of claiming symptoms on inventories like the Pt Scale. The tendency to monitor and maintain vigilance results in awareness of pressures from the environment which allows them to be coped with instead of their producing unstructured feelings of anxiety.

However, the studies that have been cited showed that in the absense of stress, low scorers on the Pt Scale learned faster and were less stereotyped than were high scorers. There is then, an interaction between stress, the ability to monitor behavior, and a subject's Pt Scale score. With low stress the Pt- subject monitors his behavior more than does a Pt+ subject. Higher levels of stress arouse monitoring processes in the Pt+ subjects but interfere with the monitoring ability of Pt- subjects.

The hypotheses of this investigation were that when ability is held constant:

1) To the extent that academic performance is performance under stress, there will be an overall positive correlation between Pt scores and academic performance.

2) To the extent that academic performance is not performance under stress, there will be an overall negative correlation between Pt scores and academic performance.

3) For subjects who are both Pt+ and high on acquiescence, their acquiescence score reflects their monitoring behavior and will be the more

accurate predictor of performance.

4) For subjects who are both Pt- and low on acquiescence, their acquiescence score reflects their monitoring behavior and will be the more accurate predictor of performance.

5) For subjects who are Pt- but high on acquiescence, the Pt score will be the more accurate predictor of performance.

6) For subjects who are Pt+ but low on acquiescence, the Pt score will be the more accurate predictor of performance.

In addition, it was the plan of this study to include sub-analyses for different academic majors, different living arrangements while in college, and different types of high school background. These sub-analyses provide an opportunity to identify specific sources of stress.

Procedure

The subjects in the investigation were 351 male undergraduate students in their first year at The Johns Hopkins University. Three tests were administered to all subjects, the Psyshasthenia Scale of the MMPI and two measures of the acquiescence response set. One measure of the acquiescence response set is the social acquiescence scale developed by Bass[1] and the other measure is the measure of general acquiescence response set developed by the author of this proposal.[2]

---

[1]Bass, B. M. Development and evaluation of a scale for measuring social acquiescence. J. abnorm. and soc. Psychol., 1956, 53, 296-299.

[2]Kuethe, J. L. The positive response set as related to task performance. J. Pers. 1959, 27, 89-94.

The Registrar's Office of the University supplied the Scholastic Aptitude Test scores of each student. At the end of the academic year, grade point averages were supplied by the Registrar's Office for each of the students in the first year class.

In summary, the antecedent variables are: scores from the Scholastic Aptitude Test of The College Entrance Board Examination, Psychasthenia Scale scores, and two measures of the acquiescence response set. The criterion variable was grade point averages at the end of the first year of college.

Results. Part I. Overall Analyses

Scores on the personality measures were obtained from 351 subjects. Of these, 333 subjects completed their freshman year of college. The major analyses were performed on the group of 333 subjects for whom grade-point averages were available.

For the 333 subjects an overall analysis was performed, followed by individual analyses with the subjects classified by their academic majors (Engineering, Biological Sciences, Physical Sciences, and Humanities). Next an analysis was performed with the subjects classified on the basis of whether they lived at home or in the dormitory. The last major analysis was based on a classification of the subjects into two groups, subjects from a public high school versus those from a private high school.

The following abbreviations will be used: (GPA) grade-point average, (Acq.) acquiescence score, (Pt) psychasthenia score, (Verb.) verbal aptitude score from the Scholastic Aptitude Test, and (Decile) decile standing in high school.

The two measures of acquiescence intercorrelated .73. Since this intercorrelation approximates the reliability of these measures, it must be concluded that these two scales measure largely the same thing and to the same extent. In other terms, their useful variance, as limited by their reliabilities, is completely accounted for by the extent of their intercorrelation. Bass's measure of acquiescence was used in the analysis as the index of acquiescence because of its slightly higher reliability, but more importantly because its greater ease of administration makes it the more practical instrument for use in predicting academic performance.

Grade-point averages are computed on a 10 point scale (0-Failure, 2-D, 4-C, 6-B, 8-A, and 10-Honor). Decile standing in high school senior year was based on a scale of 1 for the top decile, 2 for the second decile from the top; the rest of the deciles were consecutively numbered.

Overall Analysis

For the entire group of 333 subjects the intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.114*	---	---
Pt.	-.105	.045	---
Verb.	-.303**	-.183*	-.005
Decile	-.384**	+.112	+.017

*Correlations significant at 5% level of confidence with 331 degrees of freedom.
**Correlations significant at 1% level of confidence with 331 degrees of freedom.

In order to evaluate the significant correlation between GPA and Acq., a partial correlation was computed with Verb. held constant. The partial correlation was -.063, indicating that the correlation between GPA and Acq. can be accounted for by the correlations of Verb. with GPA and Acq.

The correlation between Decile and both grade-point average and verbal aptitude is negative because Decile standing was numbered from the top decile downward. Decile standing in high school interacts with the personality variables in the same manner as does verbal aptitude. In the subsequent analyses, verbal aptitude is used rather than decile standing as the intention of this investigation was to hold ability constant, not

performance. Verbal apitutde is a measure of ability while decile standing is a measure of performance.

To test the monitoring model the Pt scores and the acquiescence scores were converted to standard z scores. A constant of 6 was added to each score to eliminate negative values. The monitoring index for a subject, his "M score," was determined in the following manner. For subjects above the median or below the median on both personality dimensions, their standard acquiescence score was their M score. For subjects above the median on one personality dimension and below the median on the other, their standard Pt score was their M score.

The intercorrelations between the M scores, verbal aptitude, scores and grade point averages were:

	GPA	M Score
M Score	-.292**	---
Verbal	.303**	-.221**

**Correlations significant at 1% level of significance with 331 degrees of freedom.

The M index does not contain any information not to be found in the parent personality distributions. The M index for a subject is determined by the relative values of his scores on the two personality dimensions.

In the sub-analyses the parent personality dimensions are examined for situational interactions with grade-point averages.

Results Part II. Analysis by Academic Majors

A. There were 83 subjects in the biological sciences. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 2.12 +.011 (Acq.) -.047 (Pt) +.006 (Verb.)

	GPA	Acq.	Pt.
Acq.	-.011	---	---
Pt.	-.218*	.013	---
Verb.	.276*	-.229*	-.225*

*Correlations significant at the 5% level of confidence with 81 degrees of freedom.

B. There were 107 subjects in engineering. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 2.12 -.064 (Acq.) -.008 (Pt) +.006 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.199*	---	---
Pt.	-.038	.029	---
Verb.	.219*	-.002	.000

*Correlations significant at the 5% level of confidence with 105 degrees of freedom.

C. There were 66 subjects in the physical sciences. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 3.34 +.014 (Acq.) -.022 (Pt) +.0034 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	.002	---	---
Pt.	-.053	-.048	---
Verb.	.088	-.243	-.216

None of the correlations were significant at the 5% level of confidence with 64 degrees of freedom.

D. In order to have a large enough group for a valid analysis subjects in the social sciences and the humanities were pooled. This pooling resulted in a group of 77 subjects. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = .829 -.024 (Acq.) +.004 (Pt.) +.007 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.140	---	---
Pt.	-.035	.269*	---
Verb.	.338**	-.228	-.115

*Correlations significant at the 5% level of confidence with 75 degrees of freedom.
**Correlations significant at the 1% level of confidence with 75 degrees of freedom.

Results. Part III. Analysis by Type of High School

A. There were 263 subjects who were from public high schools. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 1.96 -.026 (Acq.) -.025 (Pt) +.006 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.125	---	---
Pt.	-.093	.022	---
Verb.	.317**	-.169*	.015

*Correlations significant at the 5% level of confidence with 261 degrees of freedom.
**Correlations significant at the 1% level of confidence with 261 degrees of freedom.

B. There were 50 subjects from private high schools. This classification does not include the few subjects who were from parochial schools. Multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 1.83 +.043 (Acq.) -.041 (Pt) +.005 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	.012	---	---
Pt.	-.178	.342*	---
Verb.	.220	-.228	-.210

*Correlations significant at the 5% level of confidence with 48 degrees of freedom.

Results. Part IV. Analysis by Type of Residence While in College

A. During their first year of college, 243 of the subjects lived in a dormitory on the campus. For this group, multiple regression analysis resulted in the following predictive equation for grade point averages:

GPA = 1.90 -.008 (Acq.) -.021 (Pt) +.006 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.064	---	---
Pt.	-.086	.097	---
Verb.	.256**	-.141*	-.016

*Correlations significant at the 5% level of confidence with 241 degrees of freedom.
**Correlations significant at the 1% level of confidence with 241 degrees of freedom.

B. During their first year of college, 90 of the subjects lived at home. For this group, multiple regression analysis resulted in the following predictive equation for grade-point averages:

GPA = 2.10 -.050 (Acq.) -.036 (Pt) +.006 (Verb.)

The intercorrelations of the variables were:

	GPA	Acq.	Pt.
Acq.	-.183	---	---
Pt.	-.098	-.140	---
Verb.	.353**	-.263*	.025

*Correlations significant at the 5% level of confidence with 88 degrees of freedom.
**Correlations significant at the 1% level of confidence with 88 degrees of freedom.

Discussion

In the overall analysis as well as in the sub-analyses, certain relations between the variables were quite consistent. While the correlations between Pt scores and grade-point averages did not usually reach statistical significance, they were always negative. Correlations between acquiescence and grade-point averages were typically negative and when positive were never significantly different from zero. All significant correlations between verbal aptitude and Pt scores were negative as were correlations between verbal aptitude and acquiescence. Correlations between verbal aptitude and grade-point average were always positive and usually significant. Correlations between Pt scores and acquiescence were usually positive but low. Decile standing in high school was similar to verbal ability in the overall analyses.

The second overall analysis tested the monitoring process model based on the interaction between Pt and acquiescence. The index of monitoring (M) was obtained by converting both the Pt scores and the acquiescence scores to standard scores (z scores). The M index for a subject was determined by his relative location on the two personality distributions. For subjects above the median or below the median on both personality dimensions, their standard acquiescence score was their M score. For subjects above the median on one personality dimension and below the median on the other, their standard Pt score was their M score.

The negative correlation between M score and grade-point average was greater than either the negative correlation between Pt scores and grade-point average or the negative correlation between acquiescence and

grade-point averages. It should be emphasized that the M score does not contain any information that is not in the two parent personality scores but is rather a choice between these scores based on their relative values.

The rationale of the monitoring model needs further discussion. When a subject claims many of the "obvious" symptoms on the Pt Scale he is not being careful to avoid the implications of these admissions. He is monitoring his behavior at the time he responds to the questionnaire. Given the fact that a subject did not monitor his behavior and obtained a high score on the Pt Scale, the acquiescence measure provides an independent measure of how critical he is relative to other subjects with high Pt scores. The higher his acquiescence score (the M score for this group), the less critical he is.

When a subject with a high score on the Pt scale is low on acquiescence, there is evidence that he can be critical in some situations even though he did not monitor while taking the Pt Scale. Given the fact that he can be critical, the size of his Pt score is a relative measure of his capacity to be non-critical in monitoring behavior. The Pt score is the M score for this group.

When a subject is high on acquiescence but has a low Pt score, he has been non-critical in a general situation but appears to have avoided claiming symptoms on the Pt Scale. For these individuals the taking of the Pt Scale, which entails claiming or rejecting symptoms which deal with lack of well-being, may have been a threat and aroused monitoring. Assuming that these subjects have a low Pt score because of monitoring under stress, a relatively low Pt score within this group indicates relatively high monitoring under stress but relatively low monitoring under

conditions of non-stress. Hence, the Pt score is the M score for this group.

When a subject is low on acquiescence and has a low Pt score, he is in general critical. He is critical in not claiming symptoms and he is also critical in a "neutral" situation and avoids acquiescence. For subjects in this group, the acquiescence score reflects the tendency to be critical in general. The higher the acquiescence score, the M score for these subjects, the less critical these individuals are in general.

In summary, given that an individual is non-critical and earns a high score on both personality measures, his acquiescence score reflects the extent to which he is non-critical in a general situation. The logic is also applied to the individual who is critical and earns a low score on both personality measures, his how acquiescence score reflects how critical he is in a general situation.

The subject who claims symptoms on the Pt scale but is low on acquiescence reveals a capacity to be critical in a general situation but not in one that may involve some stress. For these subjects the Pt score is the only measure of relative differences in how successful they are in monitoring their behavior.

The subject that is in general not critical, who is acquiescent, but does monitor on the Pt Scale is responding to the "threat" of acquiescing to the positively keyed Pt by monitoring his behavior. His success in monitoring is reflected by the size of his Pt score. These individuals monitor and edit their behavior in stress situations but do not monitor in non-stress situations.

The research discussed earlier would predict that the M index should correlate positively with performance under stress and should correlate negatively with performance under non-stress. The negative correlation between the M score and grade-point average indicates that, in general, performance in college is more similar to non-stress performance than to stress performance. It may well be that the positive correlation between Pt scores and performance under stress requires the extreme stress of the special experimental designs which often use electric shock to generate anxiety.

The adequacy of the monitoring model is demonstrated by the superiority in prediction of the M index to either the Pt Scale or the acquiescence model.

A very important consideration is the negative correlation between the verbal aptitude score and the M index. In general, it may be concluded that the Scholastic Aptitude test does not generate anxiety in the testing situation as high as that generated in experiments that produce a positive correlation between Pt scores and stress.

The low correlations between the M index and performance and between the Pt Scale and performance indicate that while in general subjects are not behaving as though under stress, this is not the case for all subjects. Many subjects are behaving as the model would predict for performance under stress. This makes intuitive sense once it is determined that college experience is not, for most students, stressful to the extent of experimentally induced stress. There will always be some students for whom college performance is performance under high stress. Motivation to succeed that is unreasonably high relative to ability would

certainly be one cause of extreme stress. Such individuals would lower correlations that reflect the extent to which college performance is non-stress performance.

The sub-analyses provide an opportunity to identify specific circumstances that result in a different relation between the personality variables and performance from the relations found in the overall analyses.

In the analyses by academic major it was revealed that the highest correlation between a personality measure and grade-point averages was in the biological sciences group. The negative correlation in that group between Pt scores and grade-point-average may well be due to the large number of pre-medical students. The successful pre-medical student is very aware of anything that he believes may influence his entrance into medical school. For these students the Pt test is a threat. To the extent that they are monitoring their behavior they do not claim symptoms. The less intelligent would not adopt such a strategy with the result that the negative correlation between Pt Scale and verbal aptitude is higher than it is for students in other groups. The interesting comparison is with the combined humanities and social sciences where the correlation between verbal aptitude and grade-point average is higher than in the biological sciences but the correlations between Pt scores and both verbal aptitude and grade-point average are lower. The personality dynamics of these groups are quite different.

The analyses by type of high school the subjects attended did not provide information about personality dynamics not contained in the overall analyses. It is interesting that while verbal aptitude correlates quite significantly with grade-point averages of students from public high

schools, the correlation does not reach significance for students from private high schools. This result substantiates the findings of Fink[1] and may be due to restriction of range on the verbal aptitude scores from the private schools.

The difference between living at home and living in a dormitory did not introduce factors that were not reflected in the overall analyses. If, for example, the adjustment involved in living in a dormitory rather than at home is a source of stress, the level of stress is not sufficient to arouse the special mechanisms aroused in experimental settings.

The academic performance of most of the subjects during their first year of college related to the personality variables in the same manner that the personality variables relate to performance in non-stress experimental studies. To the extent that an individual's performance in college is reflected by extreme stress, it is probably due to idiosyncratic circumstances rather than to factors inherent in the situations represented by the sub-analyses.

---

[1]Fink, D. L., Objective assistance for decision making in college admissions. Unpublished Master of Science in Engineering thesis. The Johns Hopkins University, 1961.

Abstract

Personality Traits Related to "Stress Tolerance" as Determinants of Academic Achievement

James L. Kuethe
The Johns Hopkins University

Students are accepted by many colleges and universities on the basis of scores from the Scholastic Aptitude Test, the student's academic rank in his high school senior class, and recommendations of the high school teachers. The achievements of many students in college are not commensurate with the potential indicated by these selection indices. The problem was to identify those students who will have trouble in college even though they have demonstrated adequate intellectual ability. The purpose of this investigation was to isolate personality traits that are related to academic achievement independently of correlations with intellectual capacity.

The college student is subjected to a variety of stresses in addition to examinations; these include the general atmosphere of competition, the student's doubts about his vocational choice, and often, his fears about acceptance into medical school or other graduate school. The major stress of adjusting to a new environment is present for the many students who are away from home for the first time.

A considerable volume of research has related scores on the Psychasthenia Scale to performance in stress situations. Stress has been found to activate the characteristic defense mechanisms of the high and low scorers on the Pt Scale. These defense mechanisms play a critical role in determining the adequacy with which behavior can be "monitored."

The joint use of the acquiescence response set and the Pt scale permit an improvement in the use of the Pt Scale for predicting reactions to stress. Research indicates that the acquiescence measure serves to identify those low scorers on the Pt Scale who would have earned high scores had they not been prevented (consciously or unconsciously) by the implications of agreeing to the items on the scale.

The hypotheses of this investigation were that when ability is held constant:

1) To the extent that academic performance is performance under stress, there will be an overall positive correlation between Pt scores and academic performance.

2) To the extent that academic performance is not performance under stress, there will be an overall negative correlation between Pt scores and academic performance.

3) For subjects who are both Pt+ and high on acquiescence, their acquiescence score reflects their monitoring behavior and will be the more accurate predictor of performance.

4) For subjects who are both Pt- and low on acquiescence, their acquiescence score reflects their monitoring behavior and will be the more accurate predictor of performance.

5) For subjects who are Pt- but high on acquiescence, the Pt score will be the more accurate predictor of performance.

6) For subjects who are Pt+ but low on acquiescence, the Pt score will be the more accurate predictor of performance.

In addition, the study included sub-analyses for different academic majors, different living arrangements while in college, and different types

of high school background. These sub-analyses provided an opportunity to identify specific sources of stress.

The subjects in the investigation were 351 male undergraduate students in their first year of college. Three tests were administered to all subjects, the Psychasthenia Scale of the MMPI and two measures of the acquiescence response set. One measure of the acquiescence response set is the social acquiescence scale developed by Bass and the other measure is the measure of general acquiescence response set developed by the author of this report.

The Registrar's Office of the University supplied the Scholastic Aptitude Test scores of each student. At the end of the academic year, grade point averages were supplied by the Registrar's Office for each of the students in the first year class.

In summary, the antecedent variables are: scores from the Scholastic Aptitude Test of The College Entrance Board Examination, Psychasthenia Scale scores, and two measures of the acquiescence response set. The criterion variable was grade point averages at the end of the first year of college.

In the overall analysis as well as in the sub-analyses, certain relations between the variables were quite consistent. While the correlations between Pt scores and grade-point averages did not usually reach statistical significance, they were always negative. Correlations between acquiescence and grade-point averages were typically negative and when positive were never significantly different from zero. All significant correlations between verbal aptitude and Pt scores were negative as were correlations between verbal aptitude and acquiescence. Correlations

between verbal aptitude and grade-point average were always positive and usually significant. Correlations between Pt scores and acquiescence were usually positive but low. Decile standing in high school was similar to verbal ability in the overall analyses.

The second overall analysis tested the monitoring process model based on the interaction between Pt and acquiescence. An index of monitoring (M) was obtained by converting both the Pt scores and the acquiescence scores to standard scores (z scores). The M index for a subject was determined by his relative location on the two personality distributions. For subjects above the median or below the median on both personality dimensions, their standard acquiescence score was their M score. For subjects above the median on one personality dimension and below the median on the other, their standard Pt score was their M score.

The negative correlation between M score and grade-point average was greater than either the negative correlation between Pt scores and grade-point average or the negative correlation between acquiescence and grade-point averages.

Research was discussed that would predict that the M index should correlate positively with performance under stress and should correlate negatively with performance under non-stress. A negative correlation between the M score and grade-point average indicated that, in general, performance in college is more similar to non-stress performance than to stress performance. It may well be that the positive correlation between Pt scores and performance under stress requires the extreme stress of the special experimental designs which often use electric shock to generate anxiety.

The adequacy of the monitoring model was demonstrated by the superiority in prediction of the M index to either the Pt Scale or the acquiescence model.

The analyses by academic major, living situation, and type of high school attended did not reveal specific sources of stress for the typical college student.

The academic performance of most of the subjects during their first year of college related to the personality variables in the same manner that the personality variables relate to performance in non-stress experimental studies. To the extent that an individual's performance in college is reflected by extreme stress, it is probably due to idiosyncratic circumstances rather than to factors inherent in the situations represented by the sub-analyses.